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UNIVERSITY, LONERE - RAIGAD -402 103
Semester Examination - Winter- 2019**

Branch: B. Tech in Chemical Engineering

Sem.: - III

Subject with Subject Code: - Renewable Energy Sources (BTCHE306B)

Marks: 60 Date:-

21/12/ 2019

Time:- 3 Hr.

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., **wherever necessary**.
4. If some part or parameter is noticed to be missing, you may **appropriately assume it** and should mention it clearly

Marks

Q.1 Solve any Two of the following. 12

- A) Define renewable energy sources. List out renewable energy sources available in India.
- B) What are the various types of biomass conversion technologies? Explain any one in brief
- C) What are the components of biogas? List out the factors affecting generation of biogas.

Q.2 Solve the following. 12

- A) Give the types of Pyranometer. Explain Eppley Pyranometer with neat figure
- B) Determine sun set hour angle and day length at location of latitude 32° on March 30

Q.3 Solve any Two of the following. 12

- A) Discuss in brief about basic principle of wind energy conversion and derive the wind power formula.
- B) Explain with block diagram : Components of wind energy conversion system
- C) Give the applications of wind energy in detail.

Q.4 Solve any one of the following.

12

- A) What is ~~OTEC~~ ~~What is it~~? What is its basic principle? Explain open cycle and closed cycle system with neat schematic.
- B) A tidal power plant of single-basin type has a basin area of 24 km^2 . The tide has a range of 10 m. The turbine stops operation when the head on it falls below 3m. Calculate the average power generated during one filling/emptying process in MW if the turbine-generator efficiency is 75 percent.
Data: Density of sea water = 1025 kg/m^3 ; $g = 9.8 \text{ m/s}^2$.

Q.5 Solve the following.

12

- A) With neat flow sheet, Explain hybrid geothermal power plant.
- B) What are the various types of hydrothermal resources? Give an account of vapor dominated system.

Q.6 Solve any one of the following.

12

- A) Explain in detail about : Hydrogen production and Hydrogen storage
- B) Give the applications of geothermal energy, solar energy and biomass energy in detail

*****End of Paper *****